Scaling Up Community-Based Breeding Programs through Local Capacity Development

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One of the ways Feed the Future strives to achieve sustainable impact at scale is by investing in smallholder farmers as full partners in agricultural development. In practice, that means that many Feed the Future programs are participatory in nature, directly involving smallholders in decision-making and building their knowledge and skill sets so they can continue to improve food security in their communities after a development assistance project ends.

Feed the Future is engaging African partners in this approach through participation in the **African Goat Improvement Network** (AGIN). Supported in part by the **U.S. Department of Agriculture**, AGIN is developing state-of-the art tools through genetic research to enable smallholder communities to breed goats that can thrive in challenging climates and help sustain farming families.

Where past breeding programs failed because they were too centralized and focused on imported breeds of goats, AGIN aims instead to support participatory, community-based breeding programs engaging local farmers and other professionals in selecting which genetic traits in goats are important to their community. AGIN also plans to help smallholders implement breeding programs that are better suited to their local context and to disseminate technologies that will help farmers identify and capitalize on indigenous (rather than imported) goat breeds.

Community-based breeding programs are distinct in a few important ways. First, farmers in these programs help determine which genetic traits to select for and are trained to incorporate these traits into their breeding practices: for example, they may select for animals that have twins often. Farmers who can identify traits that will be valuable in the long term are in a better position to decide which animals to keep or sell. For example, farmers often sell the fastest growing animals when they are young because it maximizes immediate income, but with training they may choose to keep these animals in order to promote the long-term genetic improvement of the herd.

Farmers also pool their herds with those of other farmers in their communities to create a bigger and more diverse gene pool, and they receive support to set up local recording systems to monitor the performance of their animals over time and continuously improve their resilience to threats like heat and disease.

Finally, community-based breeding programs include substantial interaction between farmers and scientists as they evaluate different breeding options so that decisions on herd management are informed and collaborative. For example, farmers in a community might work out agreements on the use and exchange of sires (male animal parents used for breeding), a critical component that has historically been missing from other breeding program models for developing countries.

This participatory approach builds both capacity and buy-in among local farmers, who are less likely to return to familiar, traditional breeding practices when the programs end because they have ownership in the process of improving herd management and creating reliable record-keeping systems.

Dr. Johann Sölkner, an AGIN partner from Austria's University of Natural Resources and Life Sciences, Vienna, designed successful community-based breeding programs for sheep in Mexico and Ethiopia in collaboration with the International Center for Agricultural Research in the Dry Areas, the International Livestock Research Institute and Mexico's National Institute of Forestry, Agriculture and Livestock Research. Rather than relying on centralized staff management, these programs train and hire local students, technicians and other community members to carry out critical functions like collecting and maintaining animal records. Local hires provide a direct link between farmers and researchers in the formative stages of the program and in the delivery of extension services to disseminate best breeding practices.

Sölkner's work has demonstrated that this participatory model can help smallholder farmers move beyond the "incubator" stage of project implementation and build breeding programs that are sustainable and potentially scalable over time. Several remote communities in Ethiopia and Mexico have successfully used this approach for four years or more to improve the health, productivity and genetic quality of their animals.

Successful breeding programs will be particularly important in parts of the world that cannot support crop production at a large scale and where food animals provide an important source of high-quality protein and other nutrients critical for early childhood development. If demand for meat and dairy in diets continues to increase at the current pace, approximately 70 percent more animal-derived protein will be needed by 2050. Community-based breeding programs show promise to help create the conditions that will support animal production at a broader scale.